

Electrophoretic Studies of Model Colloidal Systems

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The coexistence of particles having different surface chemical properties, in aqueous solutions, is an essential problem in natural processes. The adsorption of organic molecules (ligands) on the surface of solid particles in such systems depends on the nature of the solid phase and on the conditions of the liquid medium: ionic strength, pH, adsorbate functionality, steric configuration, molecular weight and concentration(1). The adsorption of various ligands influences the stability of the system which is directly reflected on the transport of particles suspended in natural aquatic systems. Especially sensitive and critical zone in natural aquatic systems, is the salinity transition zone within an estuary, where abrupt changes at the solid/liquid interface strongly influence the geochemical fate of suspended particles(2). Electrokinetic study of mixtures of colloidal particles of different composition and surface properties contribute to the understanding of the properties of such systems (3,4).

In this work, the selected mixtures of inorganic oxides (SiO_2 , Al_2O_3), clay minerals and carbonates, and organic particles (PS latices, fatty acids and amino acids), suspended in aqueous solutions, represent the models for the studies of the interactions in natural aquatic systems (5,6). Their *electrophoretic mobilities* were measured and related to the changes in the composition of both the solid phase and the aqueous solution. The pH range of the solutions were defined taking into account the isoelectric points of the members of the mixed system. The concentration of the electrolyte and other constituents (ligands) were determined according to their significance in natural waters, however, within the limitations determined by the technique used (PenKem S3000 microelectrophoresis).

References

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